



Indicator: All teachers reinforce elements of mastered knowledge that can be retained in memory through recitation, review, questioning, and inclusion in subsequent assignments. (C7)

Explanation: Regular review and effective teacher questioning are vital to ensuring that important content is learned and mastered to further build students' knowledge. Teachers should briefly but thoroughly review past content before introducing new content, and review of key concepts should occur throughout the school year, with re-teaching occurring as necessary (digital learning may benefit). Teacher should also include core concepts within subsequent instruction to allow sufficient time for deeper learning. Teacher questioning should include both lower- and higher-cognitive questions for all levels of students, and teachers should be sure to allow sufficient wait time for answers. Questioning strategies such as Socratic questioning can further student learning within inquiry-based classrooms.

Questions: How should teachers review material to maximize student learning? What are effective classroom questioning practices that enhance student learning?

Learner-centered, or personalized learning refers to “a teacher’s relationships with students and their families and the use of multiple instructional modes to scaffold each student’s learning and enhance the student’s personal competencies” (Twyman & Redding, 2015, p. 3). The student is actively involved with the teacher in co-constructing their individualized learning pathway, and the location, time and pace of learning may vary from student to student (Redding, 2016). Cognitive competency, one of four personal competencies within recent personalized learning frameworks refers to “prior knowledge that facilitates new learning” (Redding, 2014, p. 4). Building students’ knowledge through effective classroom recitation practices such as effective teacher questioning, regular review of core material, and including core material in subsequent assignments are essential practices that help students acquire and retain important content in long-term memory; this content then can subsequently facilitate learning of new material.

How Should Teachers Review Material to Maximize Student Learning?

Effective teachers use regular review to reinforce previously learned material, particularly material that will be used in subsequent learning, such as math facts and reading sight words (Rosenshine, 1986). Cotton (1995) reviewed the effective schooling research and concluded that teachers should review and reteach as often as necessary to help all students master learning materials. These instructional practices should include

- Providing regular and focused reviews of key concepts and skills across the school year to monitor and strengthen student understanding.
- Introducing new material as quickly as possible early in the year or course with a minimum of review or re-teaching of previous content. Key concepts and skills learned previously should be reviewed thoroughly but efficiently.
- Rather than rehashing previously taught lessons, re-teaching should involve the use of different materials and examples than those used for initial instruction.

- Re-teaching priority lesson content until students demonstrate they've learned it.
- Using digital learning instructional activities that include review and reinforcement components where appropriate.

Students require time to process concepts and develop important skills; research shows that these concepts and skills should be developed continually over time, with students engaged in distributed practice (Marzano, 2004). Important content should also be revisited “in incrementally deeper and broader steps until the end of the course or grade to ensure deep and lasting learning” (Rogers, 2013, p. 61).

What Are Effective Classroom Questioning Practices that Enhance Student Learning?

Effective learning and achievement also requires engagement on the part of the student, with plenty of opportunities to respond to instruction (Harbour, Evanovich, Sweigart, & Hughes, 2015). Classroom questioning engages student interaction and helps teachers monitor student understanding; skillful questioning also facilitates students' acquisition of conceptual knowledge and ideally, can lead to deeper learning (Gall, 1984; Chin, 2007; Harbour, et al., 2015). Questions should be structured in ways that focus students' attention on a lesson's key elements (Cotton, 1995). Questions should address both lower-cognitive (fact and recall) and higher-cognitive (open-ended and interpretive/evaluative) levels of understanding during classroom recitations (Gall, 1984). When helping students acquire factual knowledge, teachers should ask lower-cognitive questions that most students will be able to answer correctly (Cotton, 1988). Some research has suggested that higher-cognitive questions contribute to higher student achievement (Redfield & Rousseau, 1981); teachers should ask a majority of these types of questions when teaching students above the primary grades (Cotton, 1995). Teachers should also ensure that both faster and slower learners have opportunities to respond to higher-level questions (Slavin, 1994).

Many teachers give insufficient time for students to answer questions orally during recitations (Stahl, 1994). Teacher questioning should allow for generous amounts of “wait time” or “think time;” at least three seconds for lower-cognitive questions and more for higher-cognitive ones (Ciardiello, 1986; Slavin, 1994; Stahl, 1994). When

students give incorrect or incomplete answers, teachers should probe for understanding and help them produce correct or better answers (Slavin, 1994). During whole-group questioning, teachers should reiterate, or “re-voice” student responses to their questions, in order to both affirm student responses and make their ideas available to the whole class as common knowledge (Chin, 2007).

Recent research has shown that teacher questioning within inquiry-based classrooms, which allow students to construct their own meanings (rather than solely relying on teacher-provided information), share thoughts and ideas, and guide discussions, can lead to greater cognitive engagement and learning (Chin, 2006; Smart & Marshall (2013). Questioning techniques such as Socratic questioning, involve teachers facilitating guided discussions by responding to student comments and questions with deeper, probing questions to further develop student understanding of subject matter (Chin, 2006). Students are encouraged to self-evaluate their responses, instead of the teacher doing it for them, to reflect on and improve the accuracy and depth of their understanding (Chin, 2006).

References and Resources

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